

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

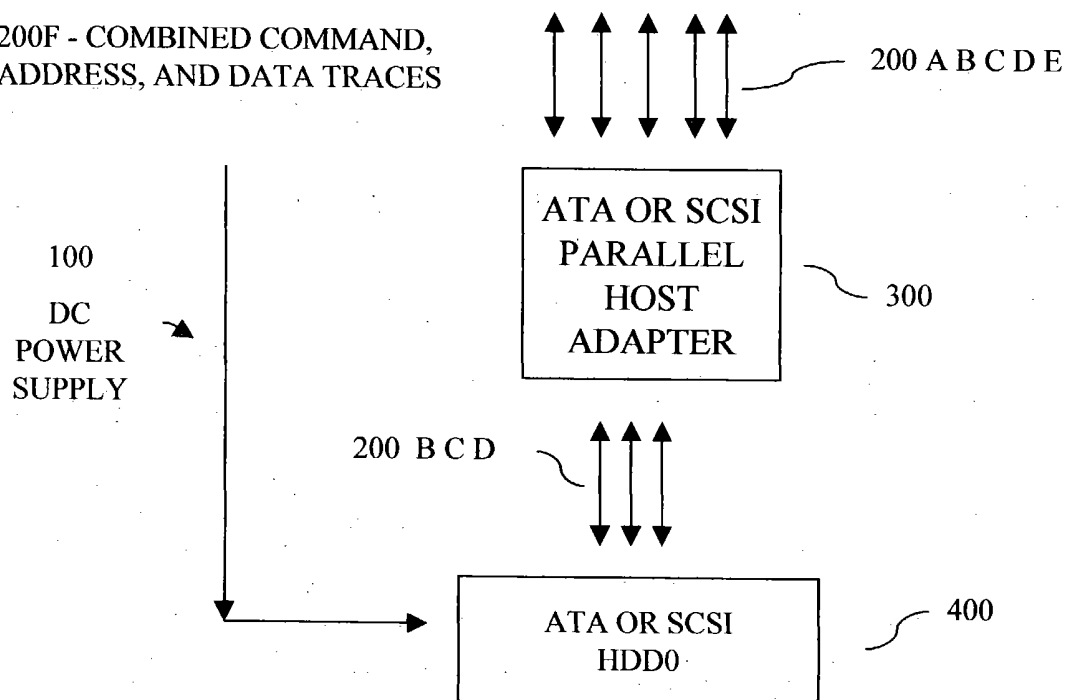


FIGURE 1: TYPICAL RELATIONSHIP OF PARALLEL HARD DISK DRIVE, ATA OR SCSI, TO HOST ADAPTER, SYSTEM BUS, AND POWER TRACES FROM SYSTEM POWER SUPPLY.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

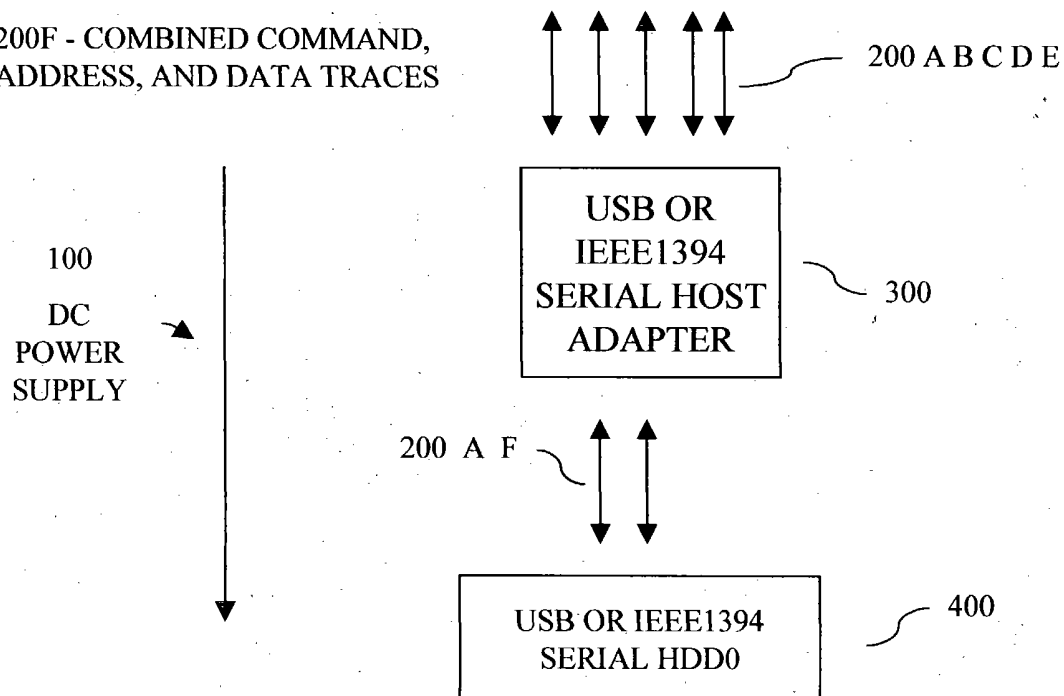


FIGURE 2. TYPICAL RELATIONSHIP OF USB OR IEEE 1394 SERIAL HARD DISK  
DRIVE TO HOST ADAPTER, SYSTEM BUS, AND POWER TRACES  
FROM SYSTEM POWER SUPPLY.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

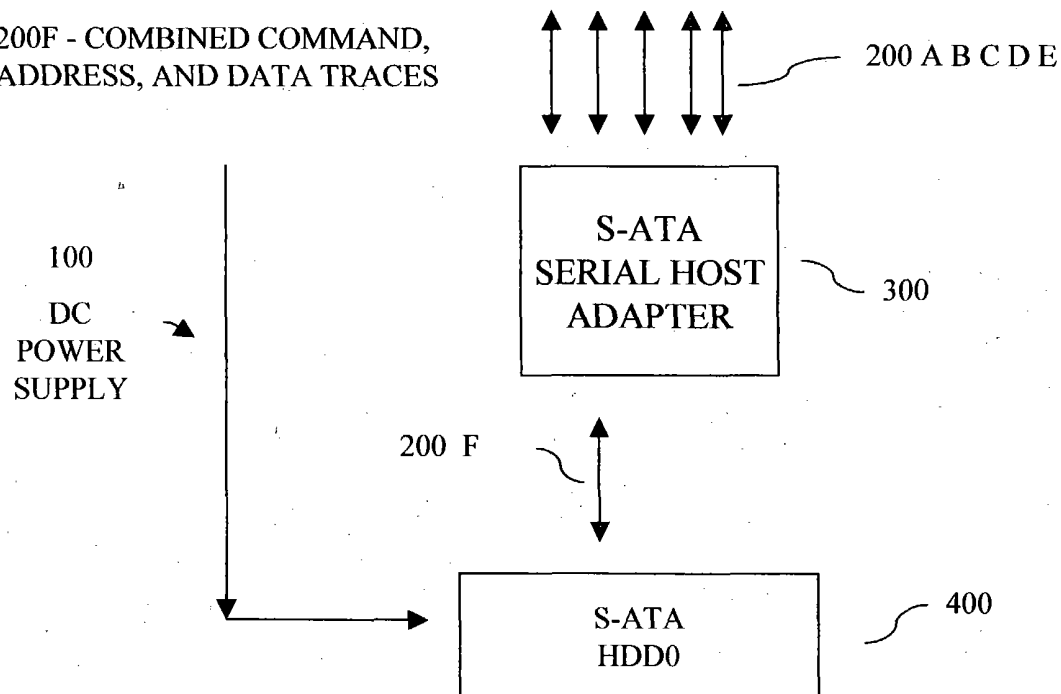


FIGURE 3: TYPICAL RELATIONSHIP OF S-ATA SERIAL HARD DISK DRIVE TO  
HOST ADAPTER, SYSTEM BUS, AND POWER TRACES FROM SYSTEM  
POWER SUPPLY.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

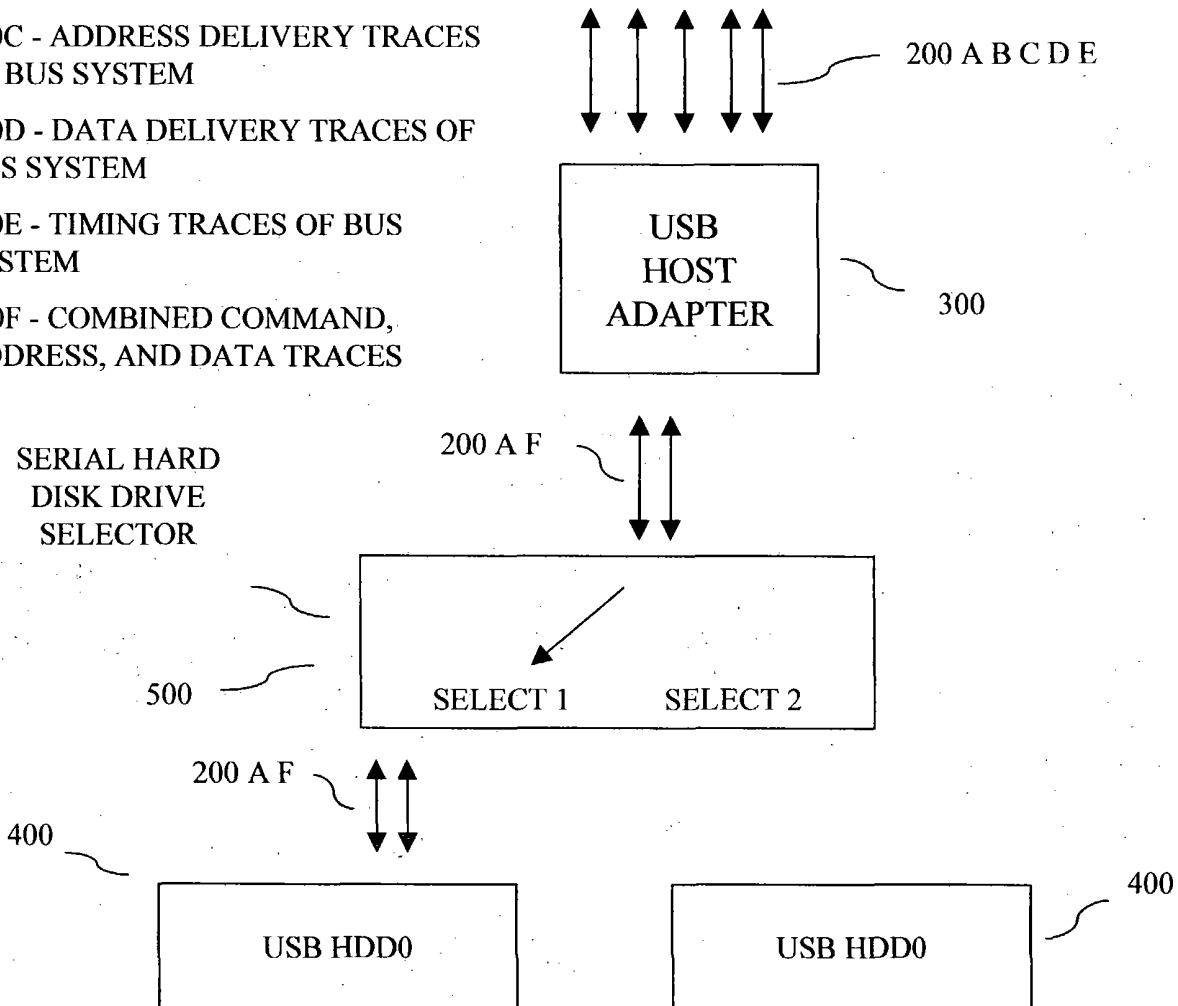


FIGURE 4: THIS INVENTION USED IN THE ENVIROMENT OF USB  
SERIAL HARD DISK DRIVES; SELECTION 1 MADE.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

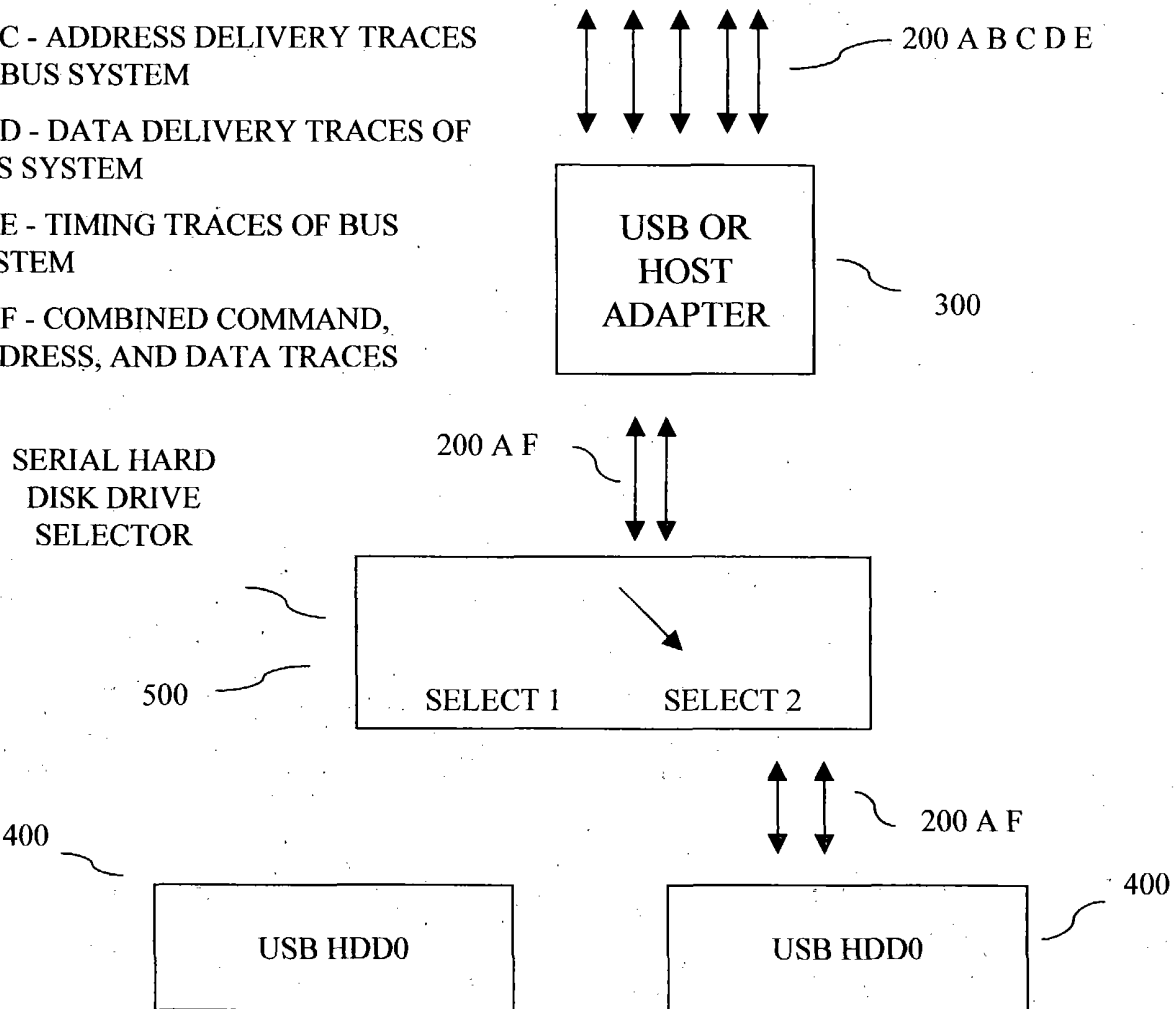


FIGURE 5: THIS INVENTION USED IN THE ENVIROMENT OF USB  
SERIAL HARD DISK DRIVES; SELECTION 2 MADE.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

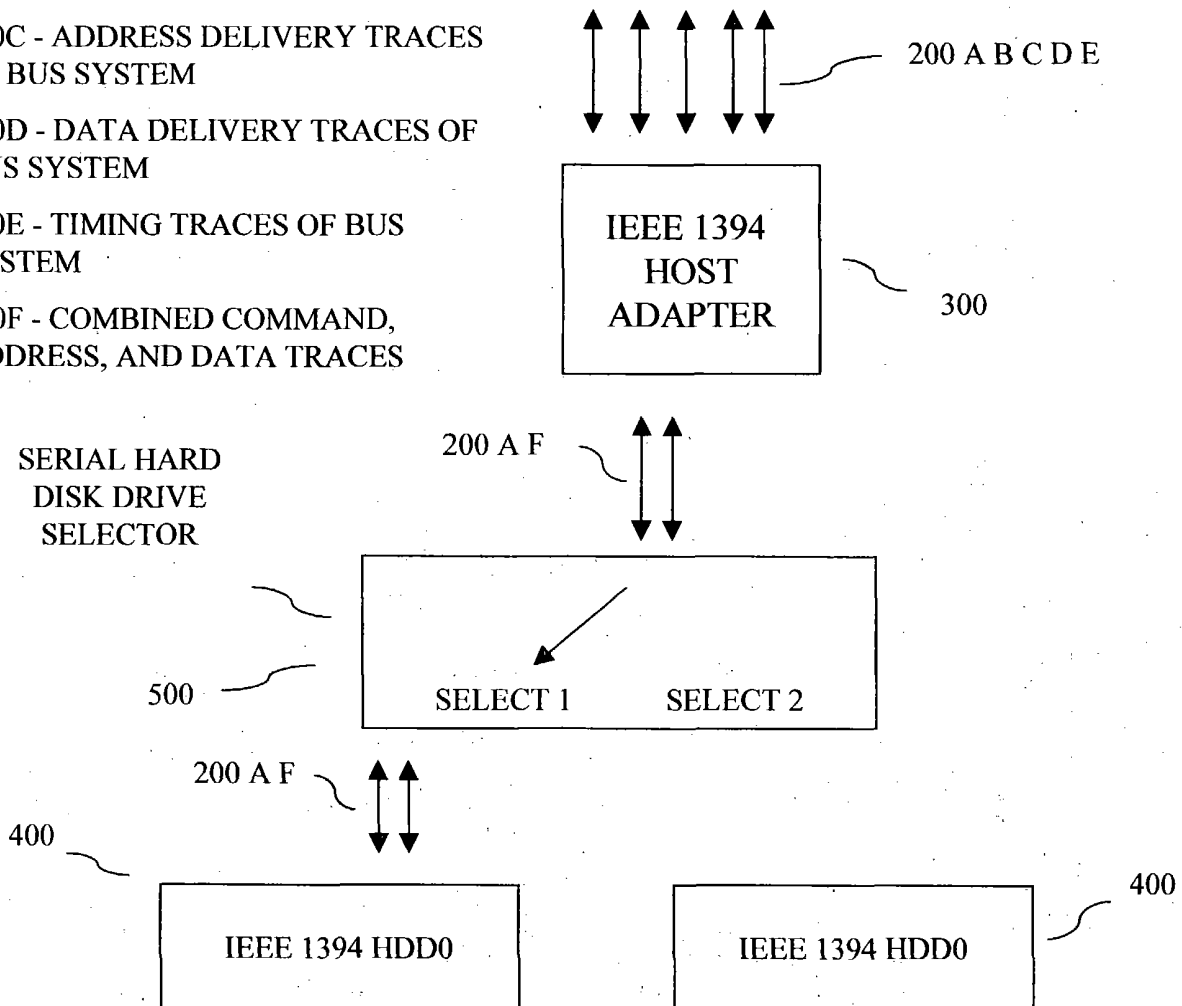


FIGURE 6: THIS INVENTION USED IN THE ENVIROMENT OF IEEE 1394  
SERIAL HARD DISK DRIVES; SELECTION 1 MADE.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

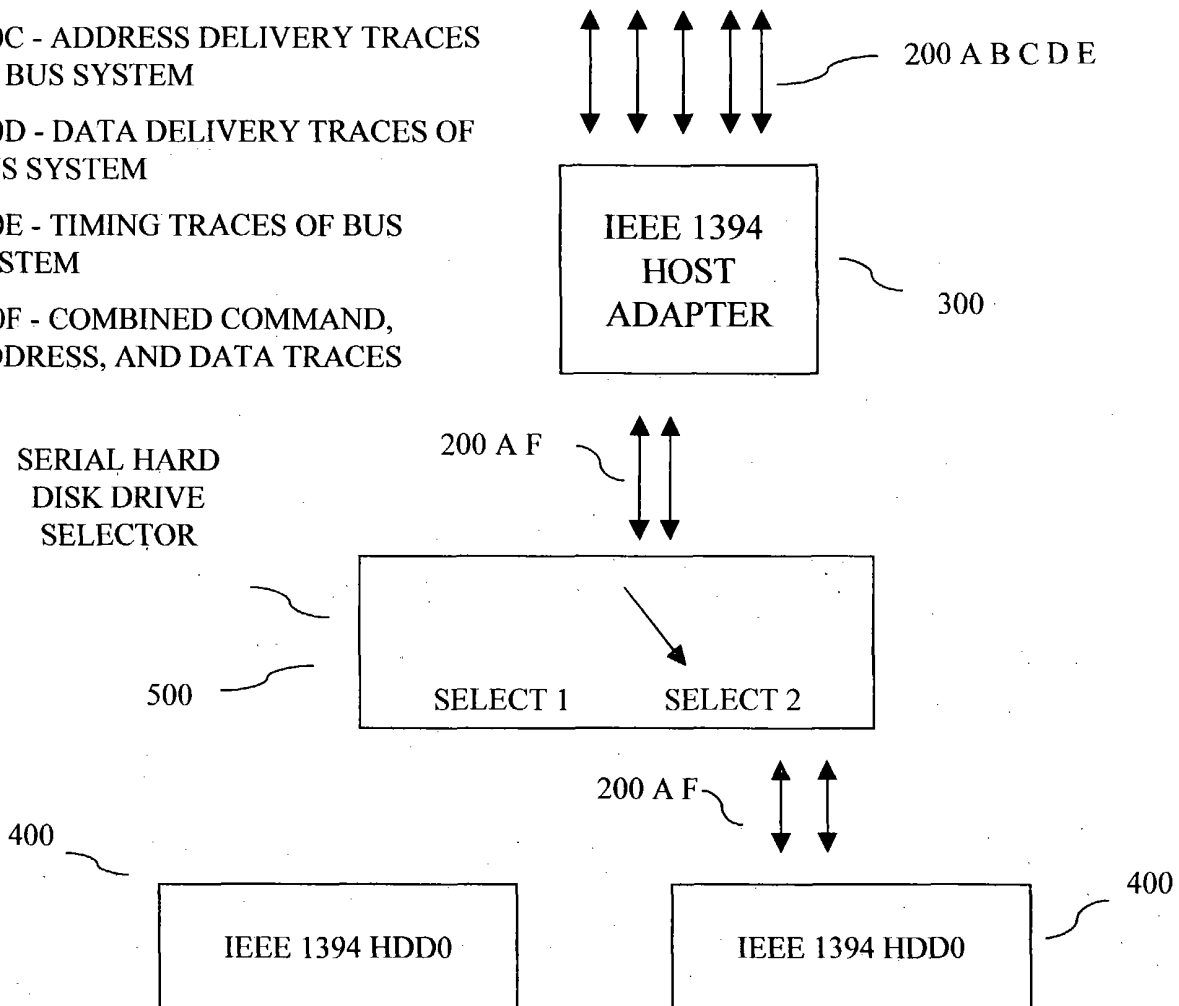


FIGURE 7: THIS INVENTION USED IN THE ENVIROMENT OF IEEE 1394  
SERIAL HARD DISK DRIVE; SELECTION 2 MADE.

200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

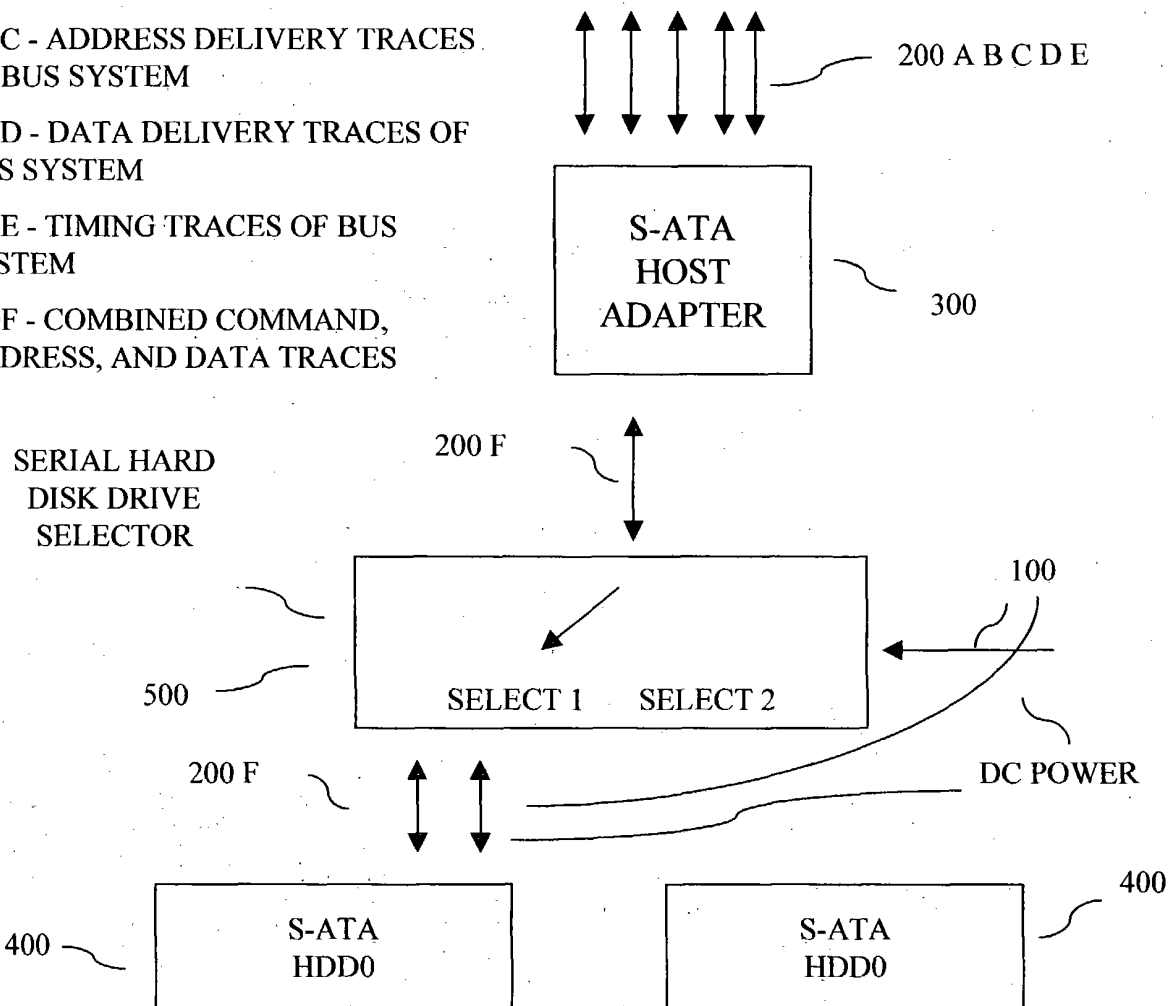


FIGURE 8: THIS INVENTION USED IN THE ENVIROMENT OF S-ATA  
SERIAL HARD DISK DRIVES; SELECTION 1 MADE.



200A - POWER DELIVERY TRACES OF  
BUS SYSTEM

200B - COMMAND DELIVERY TRACES  
OF BUS SYSTEM

200C - ADDRESS DELIVERY TRACES  
OF BUS SYSTEM

200D - DATA DELIVERY TRACES OF  
BUS SYSTEM

200E - TIMING TRACES OF BUS  
SYSTEM

200F - COMBINED COMMAND,  
ADDRESS, AND DATA TRACES

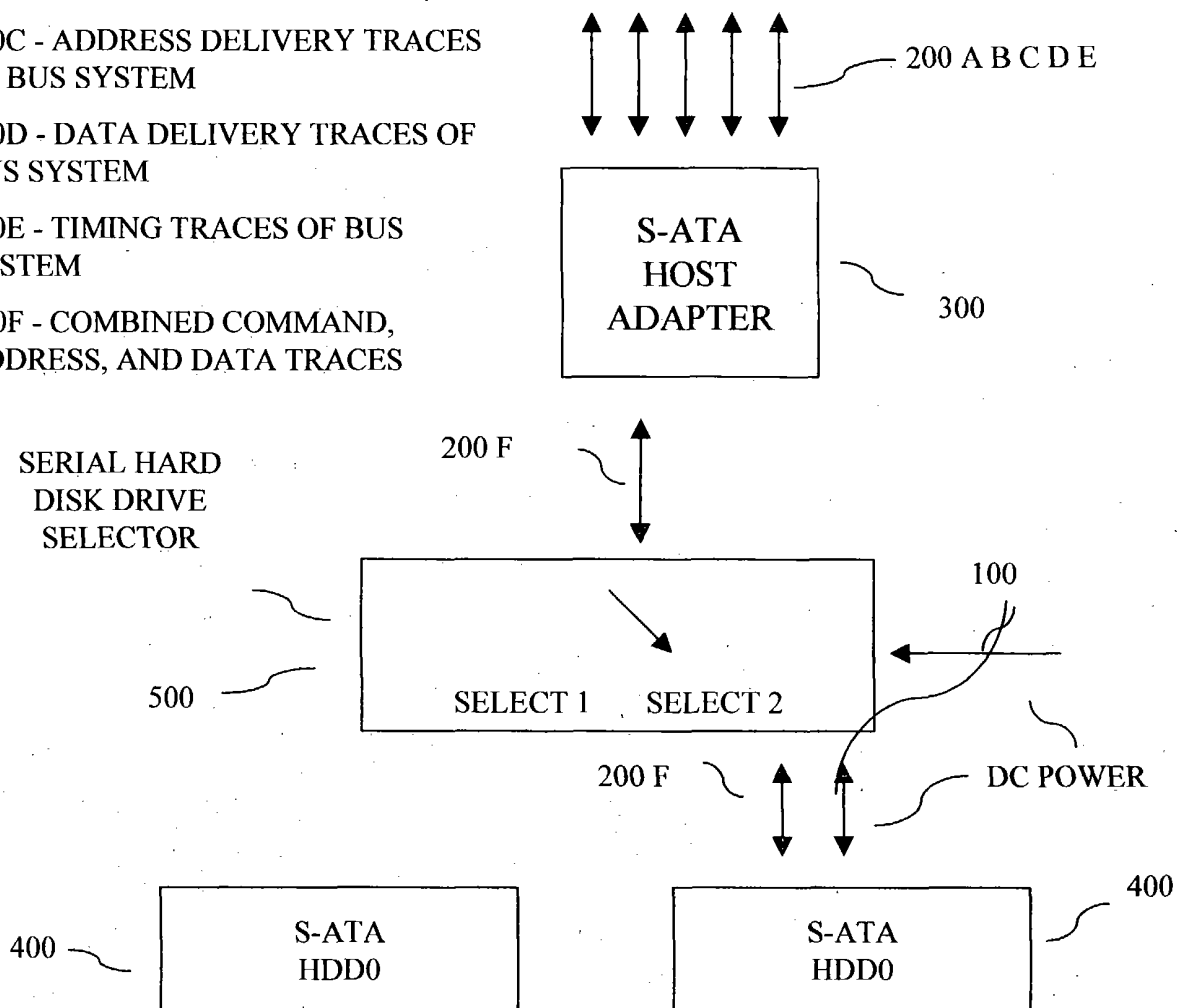


FIGURE 9: THIS INVENTION USED IN THE ENVIROMENT OF S-ATA  
SERIAL HARD DISK DRIVES; SELECTION 2 MADE.

200A - POWER DELIVERY  
TRACES OF BUS SYSTEM

200B - COMMAND  
DELIVERY TRACES OF BUS  
SYSTEM

200C - ADDRESS DELIVERY  
TRACES OF BUS SYSTEM

200D - DATA DELIVERY  
TRACES OF BUS SYSTEM

200E - TIMING TRACES OF  
BUS SYSTEM

200F - COMBINED  
COMMAND, ADDRESS, AND  
DATA TRACES

501 POWER CONTROL DELIVERY  
COMPONENT

502 ADDRESS,COMMAND, AND  
DATA CONTROL DELIVERY  
COMPONENT

503 MASTER CONTROL  
COMPONENT

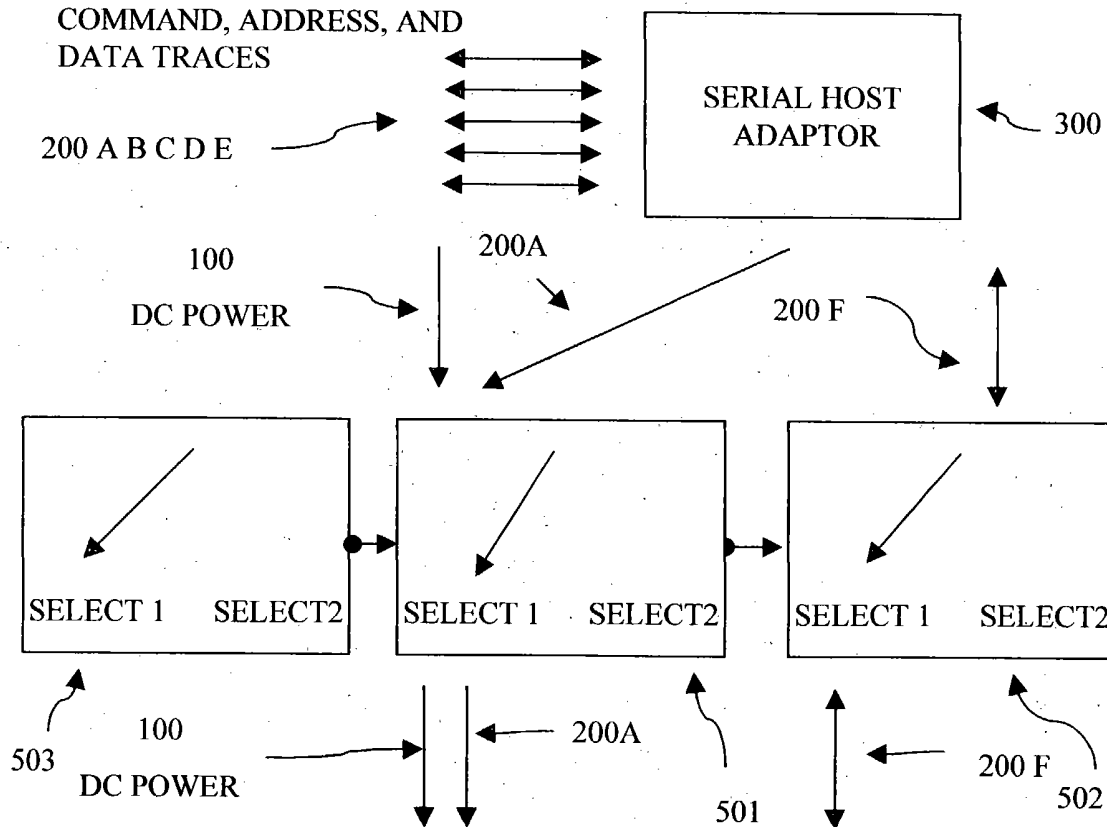


FIGURE 10: THIS INVENTION; SELECTION 1 MADE.

200A - POWER DELIVERY  
TRACES OF BUS SYSTEM

200B - COMMAND  
DELIVERY TRACES OF BUS  
SYSTEM

200C - ADDRESS DELIVERY  
TRACES OF BUS SYSTEM

200D - DATA DELIVERY  
TRACES OF BUS SYSTEM

200E - TIMING TRACES OF  
THE BUS SYSTEM

200F - COMBINED  
COMMAND, ADDRESS, AND  
DATA TRACES

501 POWER CONTROL DELIVERY  
COMPONENT

502 ADDRESS, COMMAND, AND  
DATA CONTROL DELIVERY  
COMPONENT

503 MASTER CONTROL  
COMPONENT

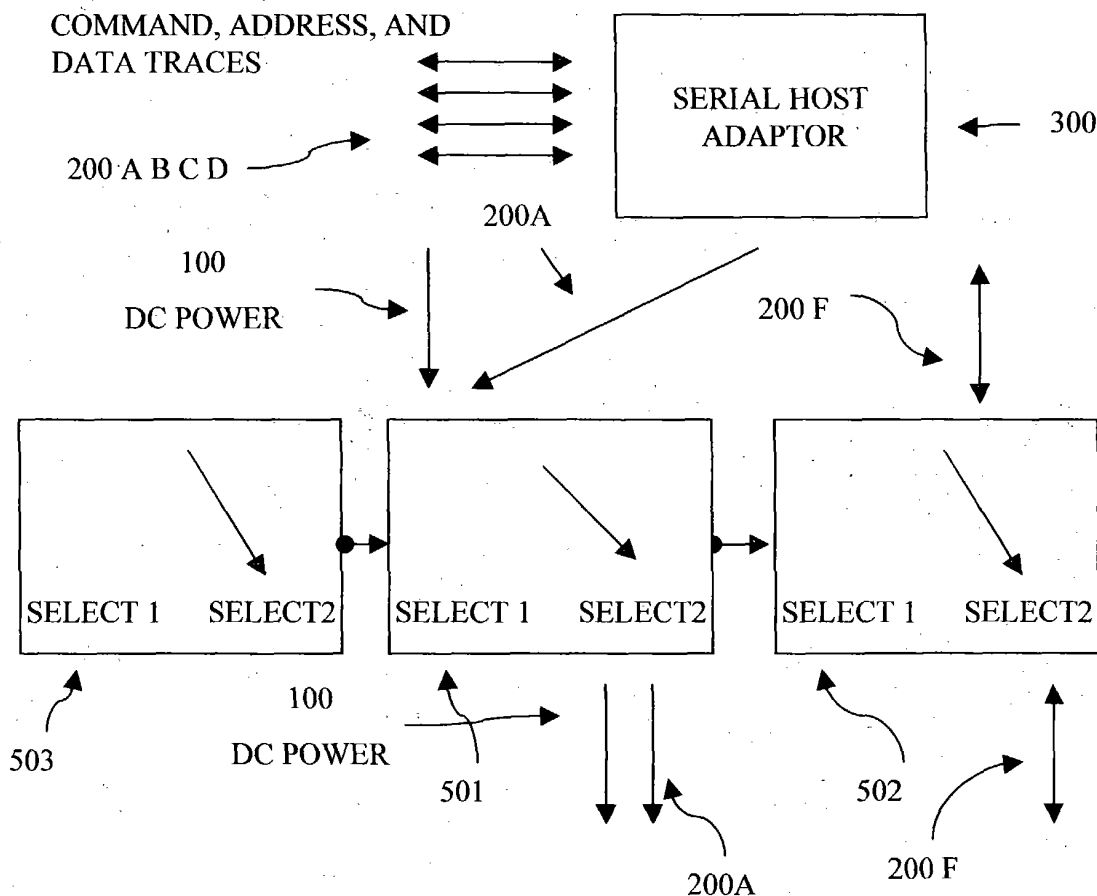


FIGURE 11: THIS INVENTION; SELECTION 2 MADE.

PIN #	PIN TITLE	PIN FUNCTION
1	VCC	POWER DELIVERY FROM BUS SYSTEM
2	-DATA	ADDRESS, COMMAND, AND DATA TRANSFER
3	+DATA	ADDRESS, COMMAND, AND DATA TRANSFER
4	GROUND	GROUND
5	SHELL	GROUND, DRAIN WIRE

FIGURE 12: UNIFORM SERIAL BUS SERIAL HARD DISK DRIVE PINNOUT

PIN #	PIN TITLE	PIN FUNCTION
1	TPA+	ADDRESS, COMMAND, AND DATA TRANSFER
2	TPB+	ADDRESS, COMMAND, AND DATA TRANSFER
3	GROUND	GROUND
4	+ VOLTAGE	POWER DELIVERY FROM SYSTEM BUS
5	TPB-	ADDRESS, COMMAND, AND DATA TRANSFER
6	TPA -	ADDRESS, COMMAND, AND DATA TRANSFER
7	SHELL	GROUND

FIGURE 13: IEEE 1394 SERIAL HARD DISK DRIVE PINNOUT

PIN #	PIN TITLE	PIN FUNCTION
S1	GROUND	GROUND
S2	A+	ADDRESS, COMMAND AND DATA TRANSFER
S3	A-	ADDRESS, COMMAND AND DATA TRANSFER
S4	GROUND	GROUND
S5	B-	ADDRESS, COMMAND AND DATA TRANSFER
S6	B+	ADDRESS, COMMAND AND DATA TRANSFER
S7	GROUND	GROUND
P1	+3.3V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P2	+3.3V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P3	+3.3V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P4	GROUND	GROUND
P5	GROUND	GROUND
P6	GROUND	GROUND
P7	+5.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P8	+5.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P9	+5.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P10	GROUND	GROUND
P11	GROUND	GROUND
P12	GROUND	GROUND
P13	+12.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P14	+12.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY
P15	+12.0V	POWER DELIVERY FROM SYSTEM POWER SUPPLY

FIGURE 14: SERIAL ATA HARD DISK DRIVE PINNOUT